

Renewable Energy Communities



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Summary

Renewable energy communities involve groups of citizens, social entrepreneurs, public authorities and community organisations participating directly in the energy transition by jointly investing in, producing, selling and distributing renewable energy. Beyond the reduction of greenhouse gas emissions, there are many benefits for the communities involved, including economic development, the creation of new jobs, cheaper energy, self-sufficiency, community cohesion and energy security. Regional authorities can support the emergence of energy communities by providing financing, expertise and advice, and ensuring that regulatory issues can be easily understood and navigated.

What is a renewable energy community?

With increasing decentralisation of energy generation, more individuals and businesses are able to play a role in the energy system, enabling new business models and ownership structures of energy infrastructure to emerge. Many single-family houses now have integrated renewable energy generation capacity, particularly solar panels, but there are major benefits available when stakeholders work together on larger scale installations that can provide multiple benefits for the population, and which could not be achieved on an individual basis.

The terms 'renewable energy community' is often used to describe such developments, but it is a term that is able to cover a host of different projects. At its most basic, renewable energy communities involve generation of energy from renewable resources and technologies, which are partly or wholly owned by local communities. The definition is flexible, recognising that different legal and economic models abound, and that depending on the local context, numerous actors may be involved, including citizens, local businesses, charities and the public sector.

Renewable energy communities have a long history, with one of the first being the Tvindkraft project, a wind turbine which was built and installed in 1978 by hundreds of people from the community of Ulfborg, in Denmark. Since then, energy communities have grown especially strongly in Denmark, Germany, as well as in parts of the United Kingdom. By 2012, 34% of installed renewable capacity in Germany was owned by community groups.

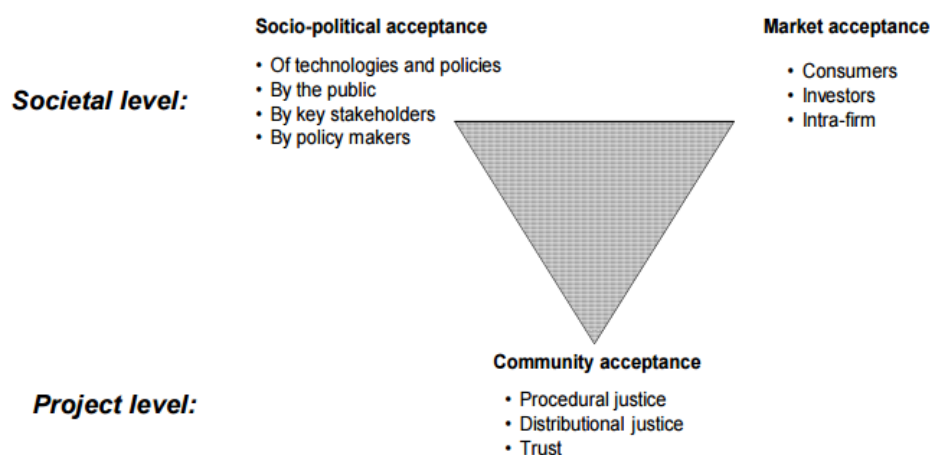
The benefits of community owned energy

European regions, led by national governments and the European institutions, are increasingly realising the benefits of the transition to renewable energy resources and the contributions they can make to smart, sustainable and inclusive growth. However, whilst greater focus is being put onto renewable energies, community owned infrastructure remains an underappreciated approach in many countries, despite the many benefits compared to the current energy system, which primarily benefits large corporations at the expense of communities and citizens.



In comparison, renewable energy communities can involve a large number of people who would otherwise not play a leading role in the energy transition. It should be as open as possible, allowing as many people to invest as wish to, and enabling those who may otherwise be economically marginalised to benefit through cheaper energy, even if not an investor in the scheme.

One of the main benefits of energy communities is that they can help to increase acceptance of renewable energies, and citizen involvement can overcome resistance to infrastructure development. The model of social acceptance built by Wustenhagen et al. (below), posits that social acceptance revolves around socio-political, market and community acceptance. Communities may reject renewable energy projects if they are deemed to have high costs for the community (such as disruption during installation, or noise during operation), whilst benefits flow to companies and individuals outside of the community. Communities can also reject projects when they are not included in planning processes, where decision-making is not transparent, or where regional heritage is not taken account of.



Source: Wustenhagen, Wolsink & Burer (2007)

Community ownership and democratic involvement can help to overcome this, as communities are involved in decision-making and directly benefit from the projects. Community schemes can then have positive spill-overs into how people think of renewable energy, increasing the likelihood that future projects will also be accepted.

Generating energy locally means that profits and energy costs do not flow out of the region, and can help to bring down the cost of energy in the long run, whilst also inducing the emergence of local value chains. As installations are owned and operated at the regional level, new jobs are created both directly and indirectly. Direct jobs are those created to manage the operation, whilst indirect jobs result from local supply chains, such as using regional biomass resources. New opportunities also encourage diversification and capacity building with existing companies (such as construction companies) seeking new training for staff, so that they can benefit from emerging maintenance contracts.



If public authorities play a role in a renewable energy community, or mandate a community to supply energy, then they can benefit from cheaper energy for public utilities, such as street lighting, and savings can be refocused on those at risk of energy poverty, or on other regional priorities.

Challenges for community energy

Whilst there are many benefits to be had from community energy, there are of course a number of challenges that can hinder development, including availability of leadership, skills and finance, as well as the roles of regulation, the existing energy market, and cultural issues.

As a first step to building a community energy system, those who are interested need to be gathered together and co-ordinated to build a legal, administrative and management structure. Many models are available, and a full awareness of regional resources is required. This task requires clear leadership and financial and legal knowledge. Without political motivation and direction from a public authority, it can be difficult for an individual to step up to a leadership role.

Renewable energy projects typically require significant up-front investment, whilst operation and maintenance costs are low in the long run. If it is not possible to raise these investments from those interested in building the community, then external financing is required. Many banks and financial intermediaries have low awareness of community energy structures, and convincing them of the business case for investment can be challenging. Many lenders refuse to provide debt to co-operatives altogether.

Regulatory issues, including land management and planning laws, can be major barriers to community energy development, especially if it is being created by local actors, who may not have the know how or capacity to independently handle the bureaucratic requirements.

Community project developers may also run into barriers related to permits and environmental impact assessments that they are not equipped to overcome. Communities can also face challenges in entering the energy market, gaining access to grids and competing on a fair basis with energy utilities, where distribution system operators may not recognise a community energy structure as a supplier, or may prioritise energy from other resources.

There are also cultural issues related to common ownership which may impact development of community energy. Countries such as Germany and the Netherlands have long traditions of co-operative ownership and decision-making, partly explaining their success in community energy. Citizens in post-communist countries, on the other hand, may have greater resistance to community or co-operative schemes which some consider to resemble collective ownership.



Models for renewable energy communities

Many of the challenges identified can be overcome through the form that an energy community takes, and business models and structures can vary greatly depending on driving forces and the willingness of individuals to get involved.

There are a number of ways to organise energy communities, which will be determined by the stakeholders involved, resource availability and community demand. The overall mission and objectives of the endeavour will also influence organisational strategy, structure and activities, as well as financing. Typical business models can include co-operatives, charities, development trusts or businesses with community-only shareholders.

In terms of aims and mission, community energy infrastructure can be run on a not-for-profit basis to provide cheap, or discounted, energy for a marginalised or rural community, or can be run as a profit-making enterprise to bring additional income to an area. For example, the Island of Eigg in Scotland, which was not connected to the UK's electricity grid, has installed solar, wind and hydropower, generating nearly 100% of the island's energy needs. The project was supported by the charity Community Energy Scotland, with the aim, not of generating a project, but of ensuring a steady, clean energy supply for the island's fifty inhabitants. Alternately, a community energy scheme may be established by a group of local entrepreneurs looking to diversify their income whilst benefitting the community.



Eno Energy Co-operative

In Eno (Joensuu, Finland), twelve local forest owners joined together to provide heat to public buildings using locally available biomass. The co-operative has grown now to fifty-five forest owners, who own and operate three district heating plants with a distribution network of around 11 kilometres. The members of the co-operative can provide the heating network with around 30% of its wood fuel requirements, with the remainder sourced from other local suppliers. Over fifteen years, customers have saved over four million Euros compared to fossil fuels, whilst creating the equivalent of ten full time jobs and diversifying income for forest owners. In total, it is estimated that the co-operative provides economic benefits to the region of around 2 million Euros per year.

[Click here to find out more about this practice](#)



Investments into infrastructure can be open to all people within a community, or only to specific sections of it, for example, only to business owners, social housing tenants or tenants of multiple-occupancy buildings.



Solar Photovoltaic Communal Farm Scheme

In the Rabat region of Malta, the roof of the Tal-Fiddien Reservoir has been converted into a solar photovoltaic farm that invites investments from citizens who may not be able to invest in solar PV in their own properties as they lack a suitable surface (such as in a ground floor apartment). The installation contains 4,000 PV panels totalling 999 kWp (kilowatt peak – the electricity production of a PV system when at maximum capacity). Residents can purchase between 1-3 kWp at a price of EUR 1,500 per kWp and in return they benefit from a feed-in tariff of 15 cents per kWh generated for the first six years, and 10.5 cents for the remainder of the twenty year lease. The scheme was established by the Maltese Energy and Water Agency to boost renewable energy generation on the island. Despite an initially slow start, the scheme has been very successful, with all 999 kWp purchased within nine months of the launch, by around 400 households.

[Click here to find out more about this practice](#)

A number of different legal forms are possible for community renewable energy, though the exact details and requirements will change from country to country. The table below presents legal forms found throughout Europe, from most bottom-up to most top-down.

Legal forms for community energy

Legal Form	Characteristics
Co-operative	Co-operative societies are intended to primarily benefit their members. Membership is voluntary and open to anyone willing to accept responsibilities and risks. Members benefit from generated energy, and have a say in governance and profit allocation with one vote per member. They may provide training and other benefits to members, as required to maintain the co-operative.



Partnership	Individuals may decide to work together to establish a legal partnership with the aim of providing energy to a community. Unlike a co-operative, voting power will be determined by the stake that each individual puts into the company. As well as providing a community benefit, partnerships can generate a profit.
Trusts and foundations	Trusts and foundations are established as charitable organisations, with the aim of delivering a social benefit rather than profit. These forms enable whole communities to benefit, even when individuals cannot afford to participate.
Public utility company	Public utility companies are run by municipalities, who invest in and manage the utility on behalf of taxpayers and citizens. These forms are less common than the above forms, but are particularly suited for rural or isolated areas.
Public-private partnership	Local authorities can decide to enter into agreements with citizen groups and businesses in order to ensure energy provision and other benefits for a community.

Scope and scale

Community energy projects can involve renewable energy generation technologies alone, feeding into existing grids and networks, or can include community run management and ownership of distribution infrastructure, such as local smart grids, or heating networks. On the generation side, community energy schemes can use any of a number of technologies, with solar, wind or biomass sources being the most frequently used. Examples also exist of community run small hydropower plants, which have often involved restoring abandoned infrastructure and bringing it to modern environmental and safety standards.

Renewable energy projects can vary in scale, and larger scale installations require larger management and maintenance capacity. Larger systems will also require greater capital investment, but once investment is recovered, benefits are higher, and money saved (or even earned) through community energy can be reinvested in new community programmes and infrastructure. It is rarer for a community to run a utility-scale project, which are significantly more complicated and need greater expertise and capital investment. In particular, utility-scale projects will face tougher environmental and planning barriers.

European Support

Whilst the EU has strongly supported renewable energy generation, it had not made explicit reference to them until the recast of the Renewable Energy Directive (RED II), which will come into force by the end of 2018. RED II gives greater power to citizens for self-generation and consumption of electricity, with 'renewable energy communities' being defined for the first time and given new rights.



The new RES Directive, for the first time, includes a definition of a ‘renewable energy community’. The text defines it as:

A legal entity: i) which, according to applicable national law, is based on open and voluntary participation, is autonomous, and is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects owned and developed by that community; ii) whose shareholders or members are natural persons, local authorities, including municipalities, or SMEs; iii) whose primary purpose is to provide environmental, economic or social community benefits for its members or the local areas where it operates rather than financial profits.

Article 22 of RED II is dedicated to renewable energy communities, and in it Member States agree to assess barriers to such communities, as well as the potential for renewable energy communities in their territories.

Member States will be obliged to provide enabling frameworks that can ensure that there are no unjustified regulatory barriers to community energy, that distribution system operators co-operate with energy communities, that participation is accessible to all consumers, and that regulatory and capacity-building support is provided to public authorities in enabling and setting up renewable energy communities. Member States will also need to minimise barriers to cross-border communities, and ensure that they take the specificities of renewable energy communities into account when designing support schemes.

One of the organisations that has been pushing hardest for inclusion of community energy in the REDD II is [REScoop.eu](https://rescoop.eu), the federation of European energy communities, which links over 1,250 cooperatives and one million citizens. The federation was established to support new energy co-operatives, and represents the co-operatives in discussion with policy-makers. It has set up a number of unique tools and a large amount of [learning material](#) to aid ‘starters’ – individuals interested in launching an energy community. These include best practice documents and manuals on choosing the right business model, financing, managing stakeholders, and energy democracy.

In terms of finance, the European Union supports the transition to sustainable energy use through the [European Structural and Investment Funds \(ESIFs\)](#), particularly the European Regional Development Fund (ERDF), under Investment Priority 4, ‘supporting the shift towards a low-carbon economy in all sectors’. All ESIF spending is managed via operational programmes, which are the main policy instruments targeted by the Interreg Europe programme. A number of projects are identifying good practices related to community energy, with the [COALESCCE](#) project specifically exploring how to exchange experience and good practices to boost the use of community energy.



Community owned and led energy for security, climate change and employment

The COALESCCE project brings together seven regions from the UK, Spain, Germany, Italy, Bulgaria, Romania and Hungary to look at how to increase regional capacity for community-based approaches for renewable energy generation. Recognising that so far community energy is only achieving part of its potential, the project is exploring how regions can use European structural funds to support the emergence of community owned energy. The project will perform peer reviews for the regions involved and define a report for each one with recommendations for regional action plans.

Peer review exercises have already been held in a few of the regions, including the regions in Hungary and Bulgaria, to take stock of regional strengths and weaknesses. The peer review reports make recommendations for each region and highlight good practices that could be beneficial:

- The Hungarian county Hajdú-Bihar has been recommended to demonstrate a community ESCO model, using Horizon 2020 funding, to discuss development of a community energy network, and to disseminate more information about community energy to municipalities. The region has been presented with good practices that could be replicated, including 'Community Energy Fortnight', where community groups raise awareness of their energy activities. This practice is managed by [Community Energy England](#), an umbrella organisation for community energy organisations which provides guidance to project developers and represents community energy groups in discussions with policy-makers;
- In Bulgaria, the project partners examined the ESIF Innovation and Competitiveness Operational Programme to see how it could support the emergence of community energy groups in the South West and South Central regions, where no such groups currently operate. The peer review recommended that community schemes could be set using European funds in line with Bulgarian laws for community-led local development groups, limited liability or joint-stock companies, or co-operatives.

[Click here to visit the project website](#)



Recommendations

Beyond playing the leading role in establishing a renewable energy community, through either public-private partnerships, or public utility companies, there is plenty of scope for regional authorities to support communities to establish common energy infrastructure. This can include providing expertise, advice and financing, as well as ensuring that regulatory issues can be easily understood and navigated.

Awareness raising

- Regional policy-makers can lead the way in communicating about the benefits of community energy, highlighting not only the economic benefits for those who get involved, but also the broader societal challenges that could be overcome. Community energy should be included in regional development strategies, to make clear the link between renewable energy and regional challenges, such as energy poverty, energy scarcity and unemployment;
- Regions can help to kick-start the process of community energy development by performing a regional assessment of renewable resource availability and demonstrating that there is potential return on investment. The assessment should also include a mapping of relevant stakeholders and those with technical and legal capacity to assist in community energy development, as is being done in the COALESCCE project;
- Public authorities can mandate their energy agencies or other suitable players to create a platform that can gather citizens to inform them about community energy, and enable discussion.

Finance

- Financial support – such as project development grants or low-interest loans – should be provided to groups who are interested in building community projects to enable them to perform feasibility studies and access consultancy services. Such support can be established under the ERDF;
- A key driving force behind the emergence of energy communities in Germany has been access to the country's Feed in Tariff (FiT), guaranteeing a minimum purchasing price for energy from renewable resources. Energy communities should be explicitly supported in existing support schemes, with minimum barriers to involvement;
- Although it may not be possible at a municipal level, investment and tax relief can be granted to community energy projects. Relief can also be applied to charges on consumption of energy;
- Public procurement can be used to support community energy development. Tenders for energy infrastructure can apply a minimum requirement for community ownership of shares, and regions could preference community-run models for provision of energy to public buildings and infrastructure, such as street lighting or district heating.



Expertise and Guidance

- Regional authorities can organise workshops and educational efforts to build capacity for the creation of community energy organisations, and can support the training of individuals for managing and maintaining renewable energy technologies;
- Authorities can also ensure that expertise is available when needed by community developers, by providing an information point dedicated to community energy development. This can be done in house, or through development of independent organisations such as Community Energy England and Community Energy Scotland;
- Local government departments should be available to help community energy planners with regulatory issues such as land use planning, permitting and environmental regulation;
- Authorities can designate public infrastructure, such as large roofs, closed landfills, dam faces, or reservoir tops for renewable energy community development, as was done at Malta's Tal-Fiddien Reservoir.

Legal frameworks and regulation

- Local authorities can require a minimum level of community involvement in energy infrastructures by amending planning regulations;
- Energy strategies should be amended to include targets for community energy, indicating long-term commitment. Strategies should define community energy, but avoid overly-limiting definitions that would prevent all possible legal forms from being used;
- National governments need to take stock of the possible legal forms available in their countries for establishing energy communities, and ensure that there are no unnecessary barriers;
- National and regional governments should get ready for the implementation of the RED II directive by exploring current barriers to community energy structures, particularly in relation to grid integration.

Sources, further information

- Directive of the European Parliament and of the Council of the European Union on the promotion of the use of energy from renewable sources (2016/0382)
- Li, L., Birmele, J., Schaich, H., & Konold, W., 'Transitioning to community-owned renewable energy: Lessons from Germany' (2013)
- R. Wustenhagen, M. Wolsink & M.J. Burer, 'Social acceptance of renewable energy innovation: An introduction to the concept,' in Energy Policy, Vol. 35 (2007)
- Community Power: Model legal frameworks for citizen-owned renewable energy (2014)

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